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EXAMINER	
CHEN, ALAN S	
ART UNIT	**PAPER NUMBER**
2182	7

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/923,497	CARLSON, ARTHUR J.	
	Examiner	Art Unit	
	Alan S Chen	2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED FINAL ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 7, 9-13, 16, 17 and 21 is rejected under 35 U.S.C. 102(b) as being anticipated by No. 5,955,917 to Mandell et al. (hereafter Mandell).

3. As per claim 7, Mandell discloses a communication system (Fig. 1) comprising: a communication node (Fig. 1, element 20) having circuitry adapted to determine an operating environment (Fig. 1, element 25 and 28) of the communication node; and a management information node (Fig. 2, element 22) adapted to control the communication node based on the operating environment and a plurality of stored PRBS generator definitions (Fig. 10, element 21).

4. As per claims 9 and 10, Mandell discloses claim 7, wherein the circuitry (Fig. 2, element 20 being embedded with the processor, all being considered the circuitry) to includes measurement circuitry/processor (the processor being a measuring circuitry, e.g., computing time, states and values related to the channel such as the total power signal or the phase shift).

5. As per claim 11, Mandell discloses claim 7, wherein the operating environment comprises a one channel condition (the noise of the channel that the multicarrier traffic is experiencing into Fig.2, part of the reason why amplification is done, is in and of itself a channel condition).

6. As per claims 12 and 17, Mandell discloses claim 7, wherein the operating environment comprises a preselected criterion (Column 4, lines 31-43, summation of the known pseudorandom noise sequence with the multicarrier traffic signal, hence comprising the preselected criterion of the known pseudorandom noise sequence). The preselected criterion is programmed in by an user of the system, hence qualifies as selected definitions generated by the user.

7. As per claim 13, Mandell discloses claim 7, wherein said plurality of PRBS generator definitions are stored on said management information node (Mandell describes how all of the circuitry, Fig. 2, element 20, can be embedded on the processor).

8. As per claim 16, Mandell discloses claim 7, wherein the management information node comprises a management information base (simply defined by applicant as something that controls communication system operation, e.g., the processor in Fig. 10, element 28).

9. As per claim 21, Mandell discloses a method of communication (Fig. 2) comprising determining a number of carriers to be used by a communication node (the multicarrier traffic has a specific power signature based on the number of carrier signals inputted). Based on the power measurements, the selection circuit determines which generator to use (Columns 1 and 2 pertaining to Summary of Invention).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1-6, 8, 14, 15 and 18-20 are rejected under 35 USC 103(a) as being unpatentable over Mandell in view of No. 5,034,906 to Chang et al. (hereafter Chang).

12. As per claims 1 and 18, Mandell discloses a communication system capable of handling multicarrier traffic (background of Mandell) comprising a plurality of pseudorandom noise generator definitions (Fig. 2, elements 21a-c, note, pseudorandom binary sequence definitions are a subset of pseudorandom noise generator definitions); and circuitry adapted to determine the operating environment of the communication system (or communication node, represented by Fig. 2, element 20), and to select one of the plurality of pseudorandom generator definitions based on the operating environment (Fig. 2, element 22). The selected definition is ultimately used to determine the optimal operating point of the communication system amplifier (Column 6, lines 12-20). Mandell further discloses the entire circuitry (Fig. 2, element 20) can be embedded with the processor (Column 4, lines 19-30), inherently implying the existence of storage in the form of memory.

Mandell does not disclose expressly having memory that stores the plurality of PRBS generator definitions.

Chang discloses a fundamental PRBS memory structure (Fig. 8) composed of D flip-flops combined to produce a register type memory structure typical of those that exist within a processor.

Mandell and Chang are analogous art because they are from the same field of endeavor in pseudorandom noise sequence generation.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine Chang with Mandell to implement the memory storage structure needed to store pseudorandom noise sequence generator definitions.

The suggestion/motivation for doing so would have been that it is the typical way to implement/store PRBS generator definitions (Column 4, lines 39-55) in a system. With the generators definitions embedded into the processor as described by Mandell, other chains of D-Flip Flops would therefore store the other PRBS generator definitions.

Therefore, it would have been obvious to combine Mandell with Chang for the benefit of a fundamental memory structure that is used to store a plurality of PRBS generator definitions.

13. As per claims 2-4, Mandell further discloses claim 1, wherein the circuitry (Fig. 2, element 20 being embedded with the processor, all being considered the circuitry) to include the memory, processor (the processor being a measuring circuitry, e.g., computing time, states and values related to the channel such as the total power signal or the phase shift).

14. As per claims 5 and 19, Mandell further discloses claims 1 and 18, respectively, wherein the operating environment comprises a one channel condition (the noise of the channel that the multicarrier traffic is experiencing into Fig.2, part of the reason why amplification is done, is in and of itself a channel condition).

15. As per claims 6 and 20, Mandell further discloses claims 1 and 18, respectively, wherein the operating environment comprises a preselected criterion (Column 4, lines 31-43, summation of the known pseudorandom noise sequence with the multicarrier traffic signal, hence comprising the preselected criterion of the known pseudorandom noise sequence).

16. As per claims 8, 14 and 15, Mandell discloses the communication system of claim 7 comprising the PRBS generator communicating with at least the management information node (Fig. 2, element 21 inputted into Fig. 2, element 22).

Mandell does not disclose expressly having memory that stores the plurality of PRBS generator definitions.

Chang discloses a fundamental PRBS memory structure (Fig. 8) composed of D flip-flops combined to produce a register type memory structure typical of those that exist within a processor.

Mandell and Chang are analogous art because they are from the same field of endeavor in pseudorandom noise sequence generation.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine Chang with Mandell to implement the memory storage structure needed to store pseudorandom noise sequence generator definitions.

The suggestion/motivation for doing so would have been that it is the typical way to implement/store PRBS generator definitions (Column 4, lines 39-55) in a system. With the generators definitions embedded into the processor as described by Mandell, other chains of D-Flip Flops would therefore store the other PRBS generator definitions.

Therefore, it would have been obvious to combine Mandell with Chang for the benefit of a fundamental memory structure that is used to store a plurality of PRBS generator definitions.

Response to Arguments

17. Applicant's arguments filed 12/24/2003, with respect o the rejection(s) of claim(s) 1-21 under U.S.C. §102(b) and U.S.C. §103(a) and U.S.C. §112 have been fully considered but they are not persuasive. Examiners reasons are given below.

Rejections under 35 U.S.C. 112

Claims 1-17

18. Applicant argues: "...all subject in the claims is described in the specification in such a way as to enable one skilled in the art to which it pertains to make and/or use the invention. More specifically, the specification discloses a processor. Applicant asserts that the claims disclose a 'circuitry' that performs functions, which can be achieved using a processor, fro example, determining the conditions of the operating environment may be made by a processor."

Examiner contends that merely citing the processor as circuitry does not enable one skilled in the art to make and/or use the invention. Applicant cites page 6-7 and 11 of the specification. Here, the word "processor" is defined very vaguely, which can include ANY form of circuitry that processes information. For instance, in paragraph 21, applicant discloses, "the processor, like processor, may comprise, for example, a microprocessor". It is clear that one can use a variety of different types of processing elements then, for instance in digital processing, one can use logical processing, e.g., CPLDs, ASICS, FPGAs, DSP chips, which may not necessary include elements consistent with the definition of a microprocessor, such has having an arithmetic logic unit (ALU). In fact, this circuitry may not even need to be digital, it can be some form of analog processing (e.g., signal filtering, etc) since application deals with analog signals. Furthermore, Examiner contends that the broad limitation where "circuitry is adapted to

determine an operating environment of the modem" is not enabling for one skilled in the art. The operating environment of the modem can clearly fluctuate based on temperature, electromagnetic interference, channel quality, and several other factors that change the signal to noise ratio. In a good environment where there is little noise for instance, the circuitry logically does not need to be complicated or novel. Whereas in an environment that have very low signal to noise ratio, a complicated circuit scheme may be necessary. Claiming any and all possible circuitry is not enabling.

Rejections under 35 U.S.C. 102(b)

Claims 7, 9-13, 16, 17 and 21

19. Applicant argues Mandell does not disclose claim 7. Applicant argues that "Mandell discloses a selection circuit 22 that selects one of the four pseudorandom sequences; the selected sequence is then used in computations to determine an amplifier's most desirable operating point. (Column 3, lines 51-67, and column 4, lines 1-18.)".

Examiner wishes to point out that the calibration module (circuitry, Fig. 2, element 23-25 shown by Mandell) obtains the most desirable operating point and the process of obtaining the most desirable point is equivalent to what is claimed, that the circuitry adapted to determine the operating environment. In Column 4, lines 1-18, the total signal power (as pointed out by applicant), intermodulation power, and phase shift of the traffic signals that determine the operating point of the amplifier 41. This operating point is dictated by the operating environment. For instance, if the operating environment is not good, there will be lower total signal power and therefore the operating point will have to be adjusted. The management node, indicated as element 22 and can include element 28 of Fig. 2, controls the communication node

based on the operating environment and a plurality of stored PRBS generator definitions. Based on the signal power factors and the generator definitions (Fig. 2, element 21) that determine the operating point as mentioned in Column 4, lines 1-18, elements 28, the management node selects (Fig. 2, element 22) and computes (Fig. 2, element 28) the operating point. The act of selecting and computing the operating point is a form of control.

20. As per claim 21, applicant argues "...Mandell does not teach a method comprising determining the number of carriers, comparing the number to a threshold, and selecting a PRBS generator based on the result of the comparison. Instead, Mandell teaches adding the pseudorandom sequences together, amplifying the sum, then adding the amplified sum to the multi-carrier signal, and measuring the power of the resulting signal, and based on the power of the signal set an amplifier at a desirable gain and phase. (Column 4, lines 31-65.)".

21. Examiner asserts that Mandell anticipates all the limitations in claim 21. As per Fig. 1, there are a number of carriers (denoted by multicarrier traffic) used by a communication node (the communication node can be Fig. 1, element 40). This number is determined by the designer/user of the system. All of these carriers, hence all the plurality of carriers defined by designer/user, is compared to a threshold. As broadly as this is claimed, this can read upon several items disclosed by Mandell. Every time Mandell discloses selecting of sequences PN1, PN2, or PN3 with the selection circuit, some criteria (threshold) must be met for this selection to occur. A more specific example would be indicated in Column 5, lines 1-5. The computation of the desired operating point is calculated as a result of the PN sequences without allowing the particular ratio to "exceed some threshold". If the ratio is not close enough (e.g., greater than the

threshold) to the desired operating point, the total signal power (PS) will be adjusted, e.g., another PN sequence will be selected to test to see if desired operating point is optimal.

Rejections under 35 U.S.C. 103(a)

Claims 1-6, 8, 14, 15 and 18-20

22. As per claim 1, applicant argues Mandell "...does not teach a circuitry adapted to determine an operating environment of a modem, and to select one of a plurality of PRBS generator definitions based on the operating environment. Instead, Mandell teaches a selection circuit that selects one of the four pseudorandom sequences that is used in computations to determine an amplifier's most desirable operating point, hence using a pseudorandom sequence to determine an operating environment and not vice versa."

23. Examiner applies the same arguments used for the claims 7 and 18. In particular to the operating environment of a modem, modems operate in a channel with noise as well and specific calibrations are done to make sure there is enough signal integrity for communication (hence the buzzing and hissing a standard dial-up modem makes). Furthermore, the literal definition of modem is quite generic. Taken literally, it is just a modulator/demodulator. The signals being modulated and demodulated is in an operating environment with noise. In fact, ALL operating environments have noise. Modulation as defined by Netwon's Telecom Dictionary, simply means "the process of varying some characteristic of the electrical carrier wave as the information to be transmitted on that carrier wave varies". Clearly, the multicarrier waves that Mandell describes are varied once they are input into the circuitry as admitted by applicant through the logic functions of the circuitry.

Applicant argues that Mandell uses the "pseudorandom sequences to determine an operating environment and not vice versa". Again, the desired operating point is actively sought, e.g., based on the threshold, and hence the operating environment causes the selection of the particular generator definition.

As for reasons to combine, the motivation is clear. Mandell discloses PRBS generator definitions, but doesn't disclose how they are physically stored. Chang discloses a fundamental memory structure using flip-flops to store definitions.

Conclusion

24. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan S Chen whose telephone number is 703-605-0708. The examiner can normally be reached on M-F 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey A Gaffin can be reached on 703-308-3301. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ASC
4/29/2004

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